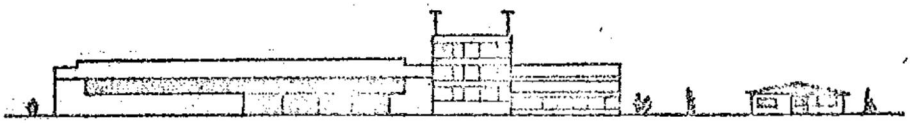
SPORTAVIA
PÜTZER GMBH & CO. KG



D-5377 POST SCHMIDTHEIM, FLUGPLATZ DAHLEMER BINZ
Telefon Schmidtheim (02447) 277/278, Telex 833602 spkg

Flight Manual

for the aircraft

Fournier RF 5

Data Sheet No.: L - 695

Serial number: 5111

Year of construction: 1972

Registration: G-AZRM

Edition: 25 - 8 - 1969

Translation of the German Flight Manual

LBA - approved: May, 19, 1969

This manual shall be kept on board the aircraft

U.K. CERTIFICATION, LIMITATIONS

CATEGORY

This type of aeroplane is eligible for certification in the General Purpose Category.

The aeroplane may be restricted to the Special Category and to a particular purpose and this will be stated in the Certificate of Airworthiness.

The aeroplane has no performance group classification.

MINIMUM CREW

The minimum crew is one pilot

MAXIMUM NUMBER OF OCCUPANTS

The total number of occupants shall not exceed two or exceed the number of seats fitted.

FLIGHT OVER WATER SPEED

The air speed for compliance with the regulations governing flight over water is 100 mph TAS.

S P O R T A V I A - Pützer
GmbH & Co., KG.

D - 5377 Post Schmidtheim
Flugplatz Dahlemer Binz

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F L I G H T MANUAL

for the aircraft

F O U R N I E R RF 5

Data Sheet N° : L - 695

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1.1 Contents

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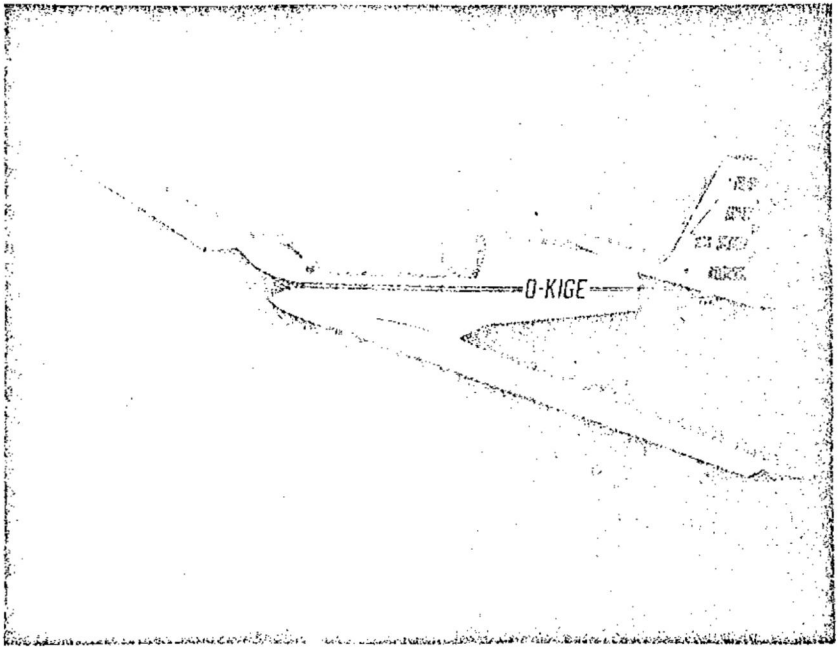
Appendix: 1: Weight and Balance
2: Loading Charts
3: T.O. Distance

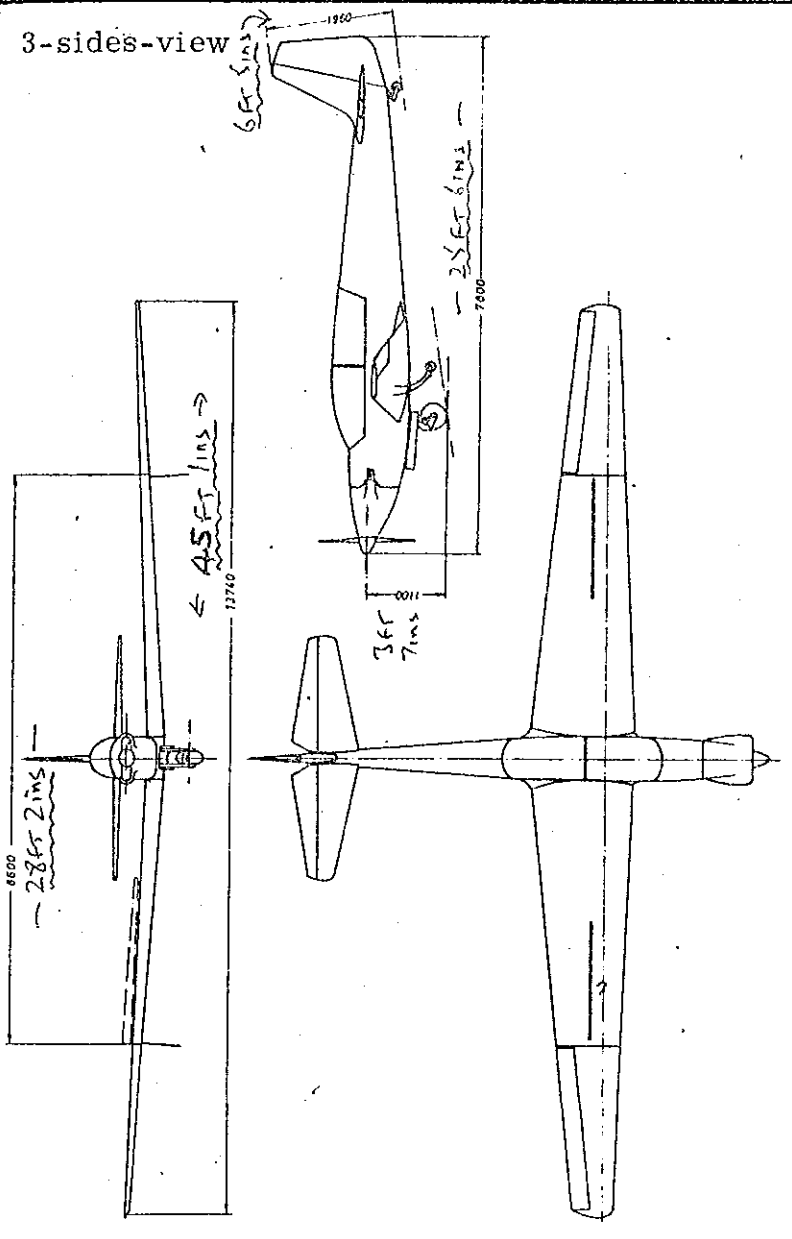
1.2 Revision

Nr.	Page	Contents of revision	Date	Signature
1	7	Designation of prop	24-2-70	
2	9,20	max. cont. RPM	15-6-91	
3	7		8-5-78	

1.3. Photograph



3-sides-view


1960
6ft 5ins
25ft 6ins
7800
45ft 1ins
13740
28ft 2ins
8600
3ft 7ins
3011

2. Operating Limitations

2.1 Basis of Certification

The F O U R N I E R RF 5 is certified on the basis of the " Vorläufige Richtlinien für die Prüfung und Zulassung von Motorseglern"(LBA - Mitteilung 10.05, edition January 8, 1959 incl. amendments from April 14, 1967) in connection with Airworthiness Requirements for Gliders (LFS, Edition February 1966 incl. amendments from May 25, 1966 and August 7, 1967).

Category: Normal Powered Glider
incl. simple aerobatic manoeuvres (see 2.7)

2.2 Speed Limits

V_{NE} - never exceed speed	250 km/h (155 mph)
V_{NO} - normal operating speed	210 km/h (130 mph)
V_{A} - Manoeuvring speed	200 km/h (125 mph)
V_{FE} - max. spoiler extended speed	180 km/h (112 mph)
V_{LE} - max. landing gear extended speed	250 km/h (155 mph)
V_{LO} - max. landing gear operating speed	130 km/h (81 mph)
V_{SO} - stalling speed spoiler extended	83 km/h (52 mph)
V_{S1} - stalling speed spoiler retracted	78 km/h (48 mph)

Markings on A.S.I.

Red line	(max. speed)	250 km/h(155 mph)
Yellow arc	(caution range)	210..250 km/h(130..155 mph)
Green arc	(normal operating range)	80..210 km/h(50..130 mph)
White arc	(spoiler extended range)	85..180 km/h(53..112 mph)

Stall warning (red lamp) starts about 10 km/h (6 mph) before reaching stall.

2.3 Engine Limits

Engine rpm (in flight)

max. rpm	(red line)	~~3400~~ 3200 ... 3600 rpm
caution range	(yellow arc)	~~3400~~ 3200 .... 3600 rpm
normal operating range	(green arc)	700 .... ~~3400~~ 3200 rpm

Ground run

with propeller HO 11 - 145 B 70 L	3100 rpm ± 100
with propeller HO 11 - 145 B 80 L	2800 rpm ± 100

Oil temperature

max. oil temperature	(red line)	~~110°~~ 120° C
normal operating range	(green arc)	60...120° C
caution range	(yellow arc)	50... 60° C

Oil pressure

operating range (green arc, limited by red lines) 2.0...4.0 kp/cm²

2.4 Crew

crew 2 persons
min. crew 1 person

Important

For single crew operation the pilot must occupy the front seat.

2.5 Weight

max. permissible T.O. weight	650 kp (1435 lbs)
empty weight (standard equipment) about	420 kp (925 lbs)
payload about	230 kp (510 lbs)

Payload consists of fuel (max. 42 kp ≙ 92.5 lbs), baggage (max. 20 kp ≙ 44 lbs) and crew. = 374 lbs.

2.6 C.G. range in flight

aircraft position horizontal	: Upper stringer of fuselage (cockpit frame) horizontal
datum.	: 200 cm (6.56 ft) in front of leading edge at wing section 110 cm (4.33 ft) from centre line of the aircraft.
max. forward c.g.	: 231.3 cm (7.59 ft) aft datum
max. aft c.g.	: 251.3 cm (8.24 ft) aft datum

Loading

Wrong loading may spoil flying qualities and performance and cause dangerous manoeuvres. The pilot shall take special regard to correct loading.

The empty weight and its c.g. position shows little difference in serial production, but can differ more with additional equipment (radio, navigation aids, oxygen etc.)

In order to obtain the correct c.g. in flight one should know each item weight and its distance to datum. Multiplying item weight with its distance to datum the moment is found. Summary of moments divided by the total weight results in the c.g. position of the loading in question.

In order to simplify this calculation one can use the loading charts in Appendix 2.

The following example may show how to proceed:

1. Take empty weight and its moment from weight and balance sheet (Appendix 1)
   example: empty weight 423.9 kp
   its moment 1000.828 mkp

2. Take from loading charts 1 and 2 (Appendix 2) for each part of the payload the moment concerned:

example:

fuel max. (60 l x 0.7 kp/l)	42.0 kp	93.2 mkp
front pilot	80.0 kp	177.0 mkp
front parachute	9.0 kp	22.6 mkp
aft pilot	81.5 kp	272.0 mkp
aft parachute	9.0 kp	32.3 mkp
baggage	4.0 kp	16.0 mkp
	225.5 kp	613.1 mkp

3. Sum up the summary of the partial loads and moments with the empty weight and its moment and you have total weight and its moment.

With these figures you enter chart 3 (Appendix 2) and you will see if you are within the permissible range or not.

In the case of the total weight moment being out of the permissible range the payloads distribution must be changed or ballast (e.g. sand- or lead cushion) must be used. When total weight moment is out of the forward limit you should put ballast into the aft seat or into the baggage compartement. When total weight moment is out of the aft limit you should put ballast into the front seat or remove baggage out of its compartment. In any case with the new partial load the same check must be done as before, in order now to be within the permissible range of moment, which means to be within the permissible c.g. range. Be careful not to exceed the weight limits (max. T.O. weight, max. baggage).

Our example results in:

partial loads	225.5 kp	613.1 mkp
empty weight	423.9 kp	1000.828 mkp
total weight	649.4 kp	1613.928 mkp

Checking in chart 3 you may state that
(a) we are very close to the limit for the max. T.O. weight
(b) we are within the permissible range for the total weights moment, whereby the payload and its distribution is o.k.

2.7 Manoeuvres

The following aerobatic manoeuvres and combinations are permitted (in brackets recommended entry speed):

	power flight	engine stopped
loop	(190 km/h; 118 mph)	(200 km/h; 124 mph)
stall turn	(190 km/h; 118 mph)	(200 km/h; 124 mph)
lazy eight	(180 km/h; 112 mph)	(180 km/h; 112 mph)
chandelle	(180 km/h; 112 mph)	(180 km/h; 112 mph)
spin	(reduce speed slowly)	

Prohibited are manoeuvres with negative load factors and flick manoeuvres.

2.8 Operating

The aircraft may be operated for VFR - flights at day with following minimum equipment:

2 airspeed indicators	1 oil temperature indicator
2 altimeters	1 fuel storage indicator
1 rpm indicator	2 safety harnesses
1 oil pressure indicator	2 back cushions

Flights under IFR - and/ or icing conditions are not permitted.

3. Operating Procedures

3.1 Normal Procedures

3.1.1 Ground Check

Remove cowling, check oil and fuel storage:

oil : min. 1.25 l (0.275 Gal. Imp.)
max. 2.50 l (0.550 Gal. Imp.)

fuel: min. 10.00 l (2.2 Gal. Imp.)
max. 63.00 l (13.8 Gal. Imp.)
rest quantity 3.0 l (0.66 Gal. Imp.)

The refuel has to be done through the opening of the left wing tank.
This tank is connected with the right tank by a pipe.

The contact of the electrical fuel storage indicator is placed at the right tank.
During refilling procedure please pay attention that the right wing is on horizontal level respectively on the right outrigger. Don't refill to fast and spend some time for overflowing from the left to the right tank.

With high temperatures keep the fuel level about 2 cm (0.5 inch) free from top of the opening.

Drain filter by pushing drain button. Ensure drain valve is closed after draining.

With all checks look for cracks, deformations, signs of oxydation, unfastened screws, lost safety pins etc.

Tail unit : overall condition - check joint - control cables - trim tab - cowling - tail wheel - shock absorber - connecting springs.

Right wing : overall condition - spoiler - aileron - outrigger - stall warning - locking device - cowling

Engine : oil leakage - prop connection - controls - battery - cowling

Left wing : overall condition - spoiler - aileron - outrigger - pitot tube - locking device - cowling

Main gear : overall condition - tyre (cracks, pressure, skid marks) - shock absorber - retracting device - undercarriage doors.

Fuselage : surface free from cracks and damage.

Canopy : clean - cracks - check normal and emergency release

Cowlings : cracks - fastenings

Cabin : clean - safety harnesses - brake - controls freely movable - seats - cushions - baggage compartment

Caution: Aircraft must not be kept outside the hangar with wings folded. After roll out of the hangar immediately unfold the wings and lock !

3.1.2 Preflight Check

Check oil and fuel storage. Ground check having been carried out (3.1.1) ?

3.1.3 Before Starting Engine

safety belts	adjust and lock
brake	on
radio	off
fuel cock	on
controls	fully moveable and free in correct sense
spoiler	check and lock
master switch	on
elektric indicators	operating

3.1.4 Starting Engine

choke	pull out
throttle	2 cm (3/4 inch) open
ignition	on (check aft panel "on" also)
starter	pull

Release starter when engine fires and push choke in.

3.1.5 Warming Engine

The SL 1700 E - engine is derived from an automobile engine, warming up only for a short time is necessary:

- 5 minutes in winter time
- time for taxying or 2 minutes with 1000 ... 1500 rpm in summer time.

Oil temperature indication is very sluggish, minimum indication shall be 50° C.

3.1.6 Taxying

brake	release (handgrip horizontal)
taxy control	by rudder through conjugated tail wheel

Taxy slowly, try to keep the wing horinzontal in order to save the outriggers. Avoid sharp turns.

3.1.7 Before Take - off

run up the engine	see 2.3
throttle	freely moveable
spoiler	locked
canopy	locked
trim	adjusted
warning lights	checked
brake	fully released

3.1.8 Take - off and Climb

Open throttle gently and accelerate up to 90 km/h (56 mph) for unstick.

Climb with 110 km/h (68 mph) and retract landing gear.

Extremely long climb shall be done with 130 km/h (81 mph) for more effective cooling. In case of oil temperature approaching the red line reduce power to cruise setting for some minutes.

3.1. 9 Retract Gear

safety lock	unlock and pull back
gear lever	pull back and push down into retracted position
safety lock	check return to locked position

Caution ! Don't forget first to unlock the safety lock before pulling the gear lever !

The gear device locks automatically, when the gear lever is pushed into the retracted position. Green control light is off when gear is retracted.

3.1.10 Stopping and Restarting Engine in Flight

Throttle into idling position, reduce speed to about 100 km/h (62 mph) switch off ignition. At higher speeds the prop is windmilling for some time ignition "off". After the prop stops opening the throttle wide will cut out undercarriage warning horn and also assist in preventing the prop from windmilling.
Restarting the engine same procedure as on the ground. Choke may be kept "off" when the engine is warm.

3.1.11 Descent

- steep descent: extend gear, throttle closed with 100 ... 150 km/h (62 ... 93 mph) extend spoilers.
- normal descent: gear retracted, reduce power just before gear warning operates, trim for 110 km/h (68 mph)

Note: Descent with 110 km/h (68 mph) is more effective by steep turns, but watch oil temperature. With extremely long descent at special atmospheric conditions carburetor icing can occur. In such cases one should increase power from time to time to warm up the engine.

3.1.12 Extend Gear

Reduce speed to 130 km/h (81 mph)

safety lock	unlock and pull back
gear lever	push forward into extended position
safety lock	check return to locked position

Adopt and always use a standard procedure. Extend the gear before " finals ". Down wind leg is recommended. Gear warning (yellow lamp and horn) operates, when throttle is reduced into idle (closed) position. Green lamp lights when gear is extended and locked.

3.1.13 Approach

- optimal approach speed

  smooth air: 100 km/h (62 mph) spoilers retracted
  110 km/h (68 mph) spoilers extended

  rough air: 10 km/h (6 mph) faster

- use of spoilers: to increase the rate of descent. They are easy to operate without any pitching moments or other difficulties. Keep the lever in your hand !

- failed landing: retract and lock spoiler, apply full throttle, maintain climbing speed 110 km/h (68 mph)

3.1.14 Landing

Landing is of usual " three pointer ".kind, in this case only of two pointer !
Reduce speed down to stall, and with stick fully back tail and main wheel should touch down simultaneously.

Wheel brake must be operated with caution !

Stop engine by switching ignition " off ". Master switch "off " also.

3.1.15 Special manoeuvres

Stall

In a static approach to the stall the red lamp lights at about 90 km/h (56 mph). With dynamic stalls or in steep turn it operates at higher speeds.

The full stall is reached at about 73 km/h (46 mph), mostly without marked aerodynamic warning. Sometimes there is some buffeting.

Aileron and rudder remain effective. Recovery by moving stick forward. Loss of altitude is small.

Spin

- first method: stall the aircraft by gently moving stick backward. Apply rudder in the direction required to spin. The first rotation is smooth, it accelerates when spin stabilises.
- second method: stall the aircraft dynamically and cross controls, i.e. aileron and rudder in opposite directions. This method endures a true spin without excessive speed being reached during recovery.
- recovery:
  - apply opposite rudder
  - ease stick forward
  - centralize rudders as the spinning stops
  - ease out of dive

  Guard against excessive speed and accelerations during recovery. Don't cease too fast.

Loop

Recommended entry speed 190 km/h (118 mph) in powered flight and 200 km/h (124 mph) with engine stopped. Dive up to entry speed, apply progressive backward pressure,

in the headover position relax backward pressure and ease out of dive.

Stall turn

Recommended entry speed 190 km/h (118 mph) in powered flight and 200 km/h (124 mph) with engine stopped. Apply rudder in an early stage when engine is stopped.

Lazy Eight

Recommended entry speed generally 180 km/h (112 mph) At the top of the manoeuvre your speed should not be less than 100 km/h (62 mph).

Chandelle

Recommended entry speed 180 km/h (112 mph). With stopped engine bank early, because you have to finish the 180° before your speed is down. At the top of the manoeuvre and after 180° your speed should not be less than 100 km/h (62 mph).

3.2 Emergency Procedures

3.2.1 Engine failure during take - off

- runway length sufficient:

fuel cock	off
ignition	off
spoilers	extend
brake	operate
stick	full backward

- runway length too short:

same procedure, eventually retract landing gear to avoid obstacles.

3.2.2 Engine failure after take - off

fuel cock	off
ignition	off

make a glider landing

3.2.3 Engine failure in flight

same procedure as before

3.2.4 Fire in engine compartment

cabin heat	off
fuel cock	off
throttle	full power
ignition	off, when engine has stopped

3.2.5 Landing gear extension failure

Gear operation is mechanical, so there is little chance of failure, except by mishandling (e.g. trying to extend gear without first unlocking and thus damaging the control lever). in such a case unlock the locking lever and apply positive " g ", if necessary several times, until the gear is heard to engage down and the green lamp is lit. Stop engine before landing.

3.2.6 Forced Landing

Generally (except on very bad ground), landing gear and spoiler are to be extended.

On very bad ground, rough or marchy, keep landing gear retracted and make a very gentle landing.

If there is any doubt about the ground conditions extend the gear, but be prepared to retract the gear immediately - even just before touch down - when ground looks bad, and " belly " on.

On water keep gear retracted. Touch - down in nearly stalled condition, stick right back.

Experience shows that the aircraft suffers little damage from a belly landing when engine has been stopped prior to the landing.

4. Performances

The performances given below are based on T.O. weight of 650 kp (1430 lbs), no wind and dry grass runway.

4.1 Take - off distance

sea - level, temperature + 15° C (see Appendix 3)

distance of ground run	216 m	(710 ft)
distance to 15 m (50 ft) obstacle	522 m	(1700 ft)
take - off speed	90 km/h	(56 mph)
speed at passing 15 m (50 ft) obstacle	110 km/h	(68 mph)

4.2 Landing distance

sea - level, temperature + 15° C

distance of ground run	200 m	(650 ft)
distance from passing 15 m (50 ft) obstacle	420 m	(1380 ft)
approach speed (spoiler extended)	110 km/h	(68 mph)

4.3 Climbing speed

sea - level, temperature + 15° C

climbing speed (gear and spoilers retracted)	3 m/s (9.85 ft/s)	
optimum airspeed	110 km/h (68 mph)	

4.4 Climbing speed (failed landing)

sea - level, temperature 15° C

climbing speed (gear extended, spoiler retracted)	2,2 m/s (7.2 ft/s)	
optimum airspeed	110 km/h (68 mph)	

4.5 Stall

stalling speed (gear and spoiler retracted)	78 km/h (48 mph)	
stalling speed (gear and spoiler extended)	83 km/h (52 mph)	

4.6 Operating range

At cruising speed ~~175~~ 160 km/h (~~110~~ 100 mph) and 1500 m (5000 ft) altitude the operating range is ~~700~~ 950 km (~~435~~ 465 st. M) with 20 min. reserve.

4.7 Fuel Consumption

At 1500 m (5000 ft) altitude there is a fuel consumption of

speed	rpm	consumption
175 km/h (110 mph)	3400	14 l/h (3.08 Gall./h)
160 km/h (100 mph)	3200	12 l/h (2.64 Gall./h)
140 km/h (87 mph)	2800	10 l/h (2.20 Gall./h)

5. Special Operations

5.1. Gliding

The following can be practised:

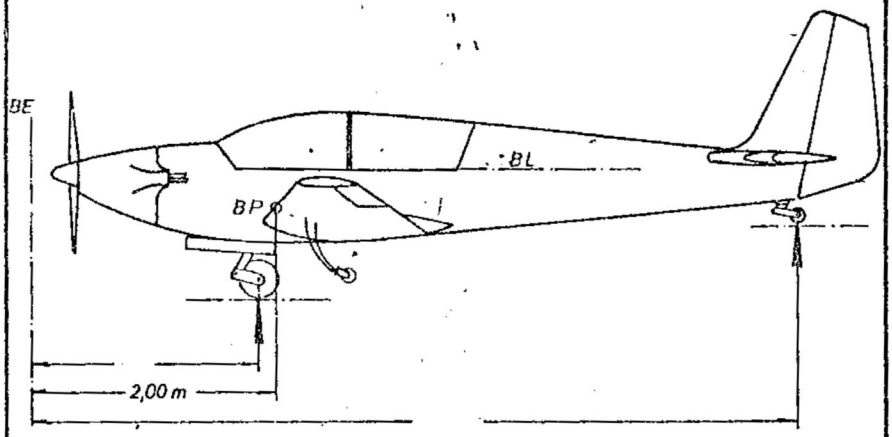
- basic training
- advanced training: i.e. exact approach and spot landing, emergency landing, navigational training, limit manoeuvres, aerobatics
- soaring

At economic cruise fly to the lift region, reduce power up to 1800 rpm. When lift is strong enough stop engine and circle at about 90 km/h (56 mph). The minimum sink is 1.35 m/s (4.5 ft/s) and the best glide ratio 1:20 at 100 km/h (62 mph).

5.2 Landing with engine stopped

Approach with a good altitude and use spoilers when necessary. Gear warning (yellow control light and horn) operates when spoilers are extended and the gear is still retracted.

Weight and balance



Axis of reference (horizontal)(BL): upper stringer of fuselage (cockpit + frame) horizontal

datum point (BP): leading edge y = 43.5 " / 1.10 m from centre line of the aircraft (0.78 ≙ 30.5" from fuselage outside wall)

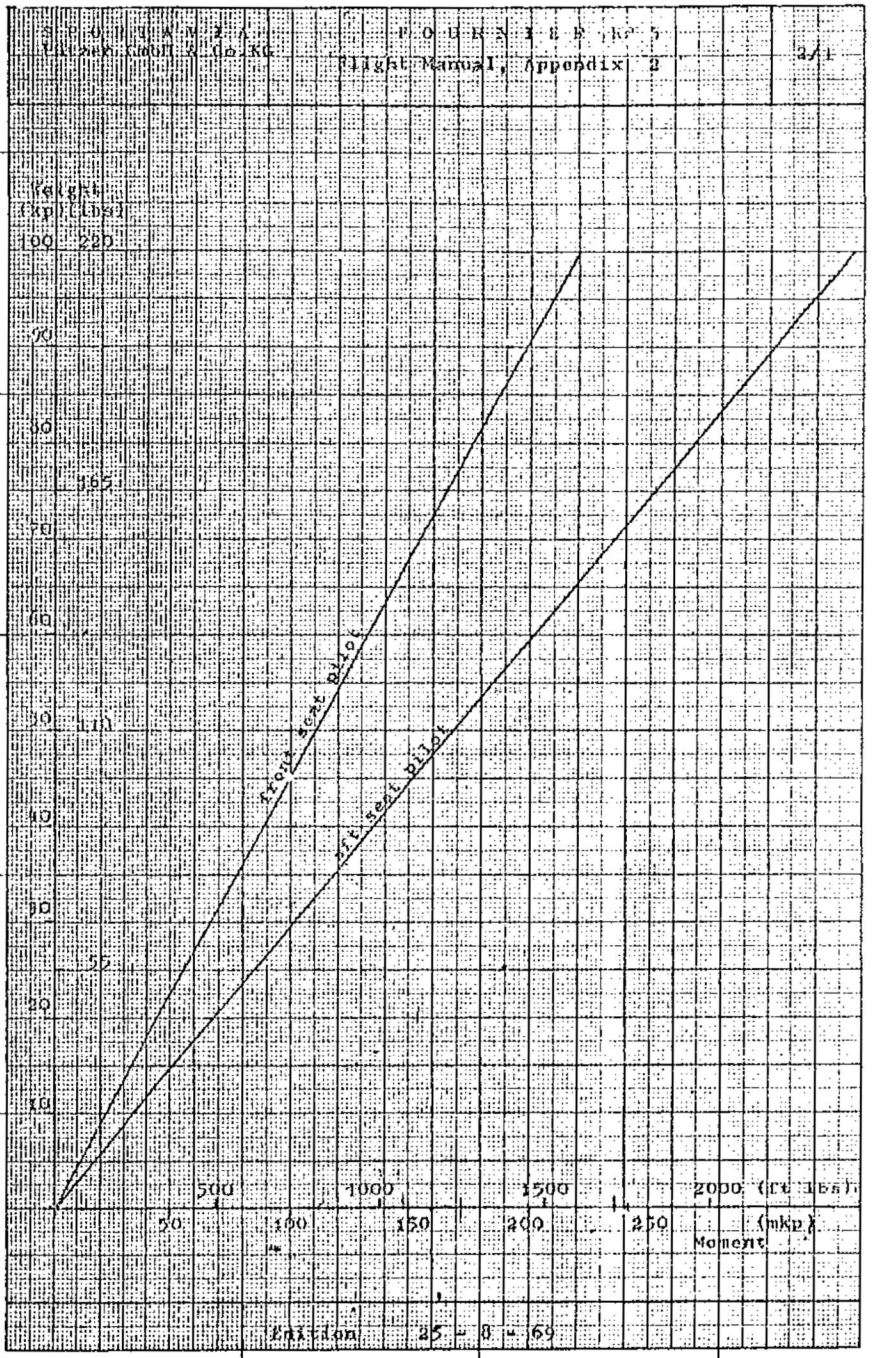
datum level (BE): 2.00 m (78.8") in front of datum point

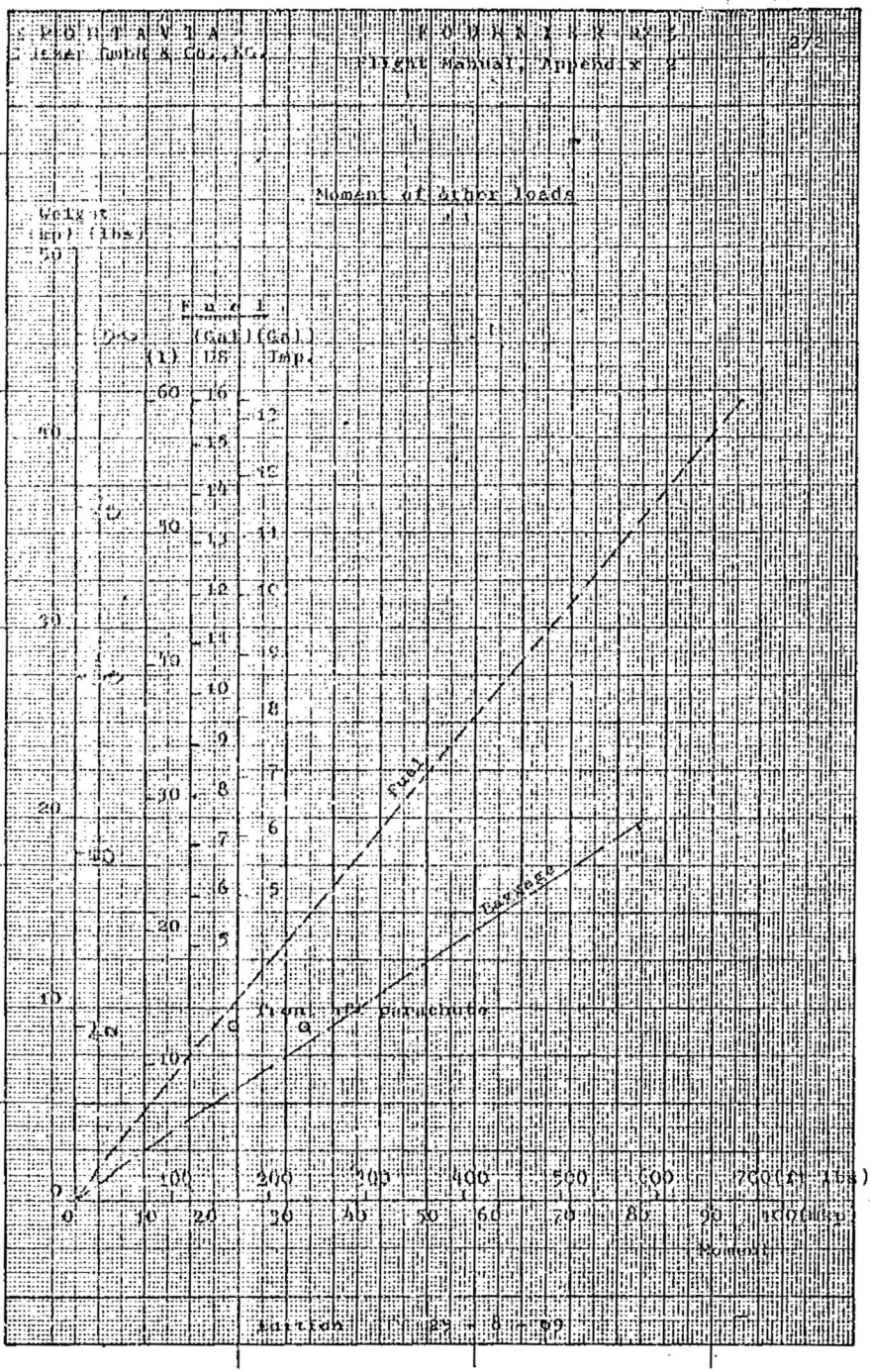
condition of balance: ready for flight, including oil standard equipment with out / with _____ Gall. fuel

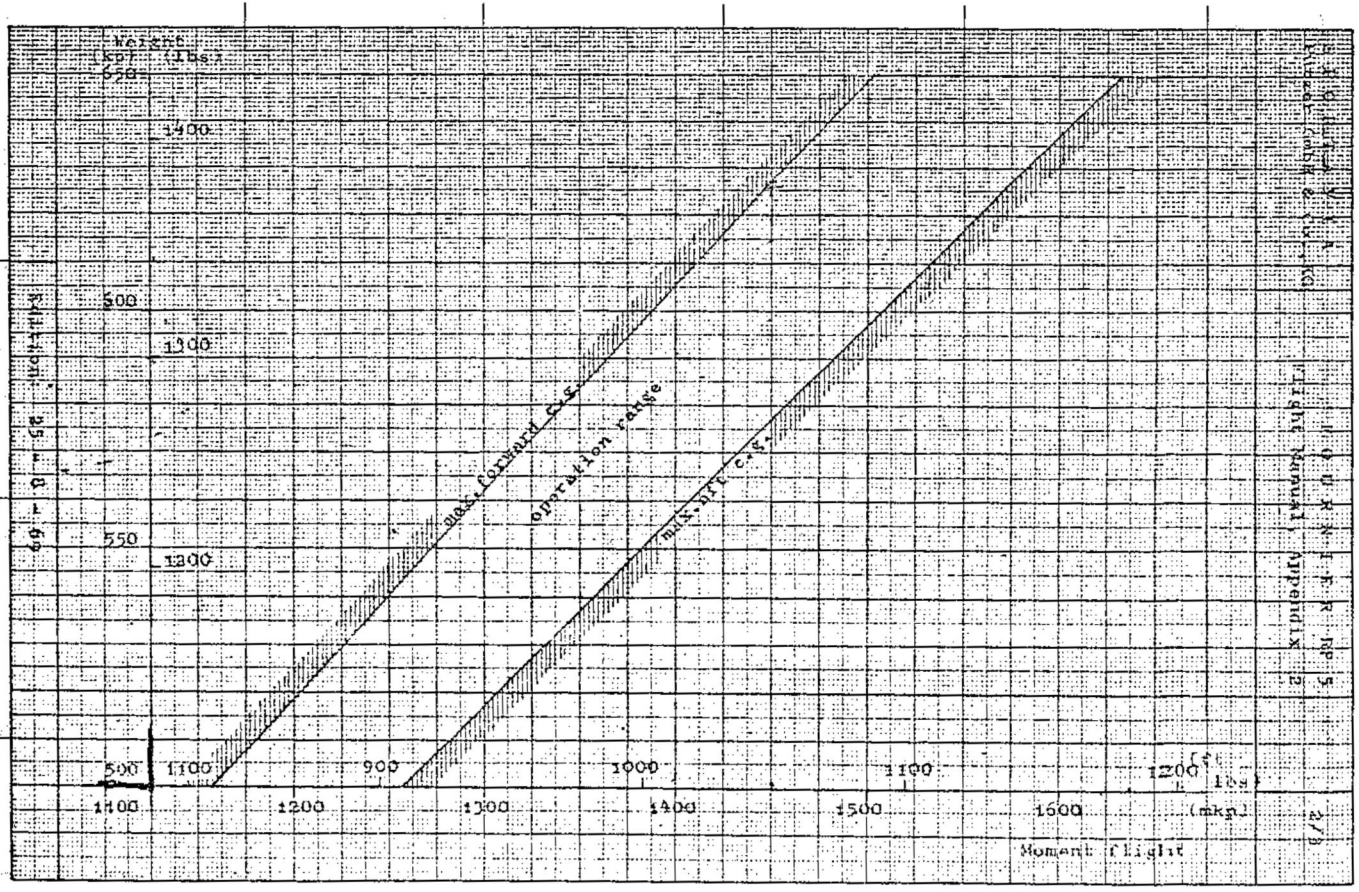
Additional equipment: _____

2. empty weight - C.G.

	Gross weight	Tare weight	Net weight	Leverarm (m)	moment (mkp)
in front					
back-wards					


Weight (kp) (lbs)
100 220
90
80
165
70
60
50 110
40
30
20
10
500
1000
1500
2000 (ft lbs)
50
100
150
200
250
(mkp)
Moment
front seat pilot
rear seat pilot


Moment of other loads
Weight (kg) (lbs)
Fuel (Gal) (Gal) Imp.
(1) US
Fuel
Cargo
From the parachute
Moment


Weight
(kgf) (lbs)
650
1400
500
1100
550
1200
500
1100
1100
1200
900
1300
1000
1400
1100
1500
1200
1600
(mkgf)
Moment flight
max. forward c.g.
operation range
max. aft c.g.
Flight Manual, Appendix 2
2/3

Take off distance

At maximum allowable weight of 1435/lbs, no wind and short, dry gras runway there are following ground runs an take off distances for different airfield altitudes and temperatures:

Altitude ft over sealevel	ground run in ft at temperatures of				take off distances over 50 ft in ft at temperatures			
	-15°C	0°C	+15°C	+30°C	-15°C	0°C	+15°C	+30°C
0	635	670	710 213m	745	1535	1630	1710 513m	1800
660	650	690	720	760	1570	1660	1740	1840
1320	665	700	745	780	1610	1700	1795	1890
1980	675	715	750	790	1640	1710	1840	1930
2640	695	740	780 235m	820 250m	1680	1785	1880 565m	1980 600m

These values are based on a good maintenance of the aircraft and a normal flight experience of the pilot.